FIG. 1

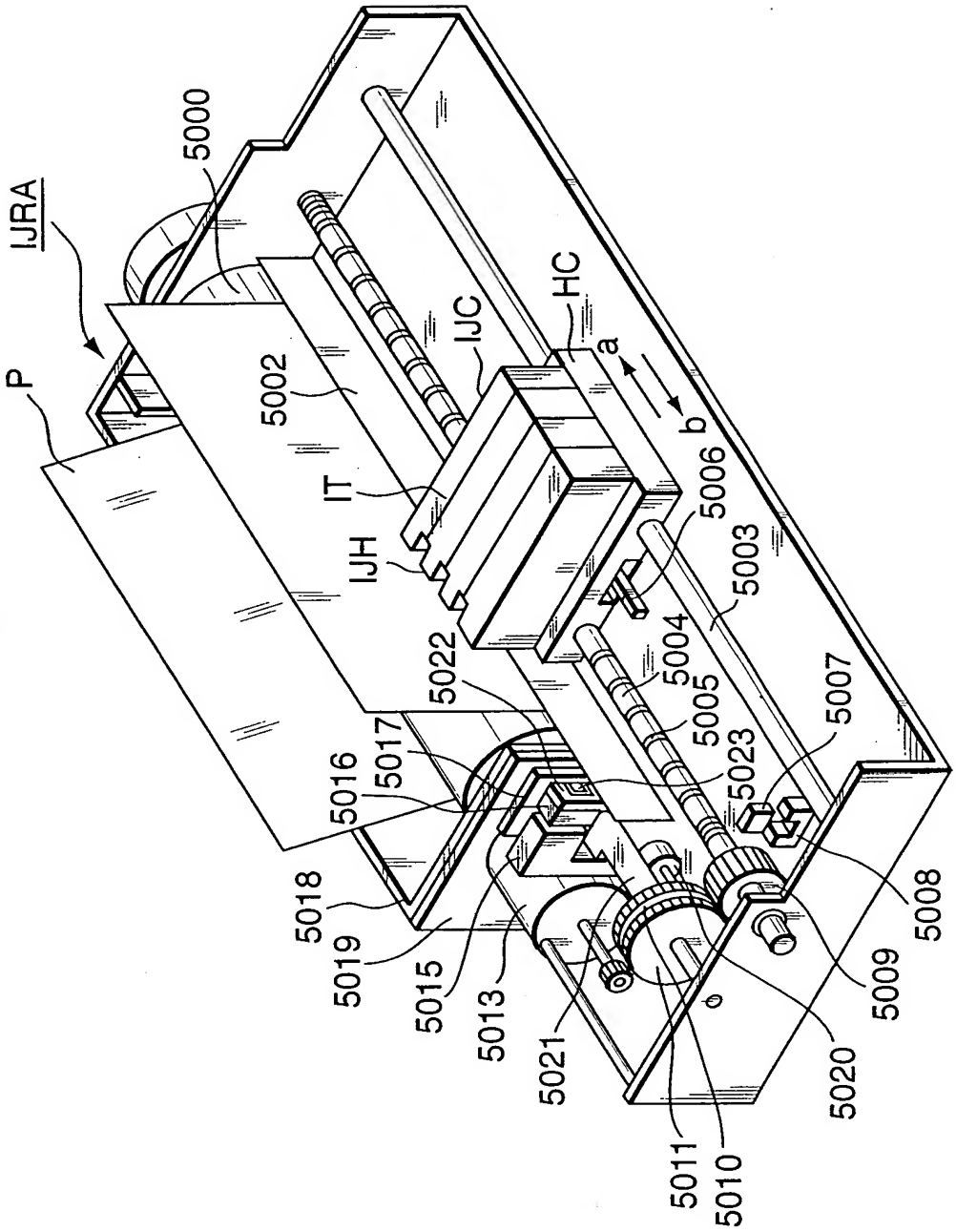

IJRA
5000
P
5002
IJC
HC
a
b
IT
IJH
5006
5003
5022
5004
5005
5007
5017
5016
5023
5018
5019
5015
5013
5021
5009
5008
5020
5011
5010

FIG. 2

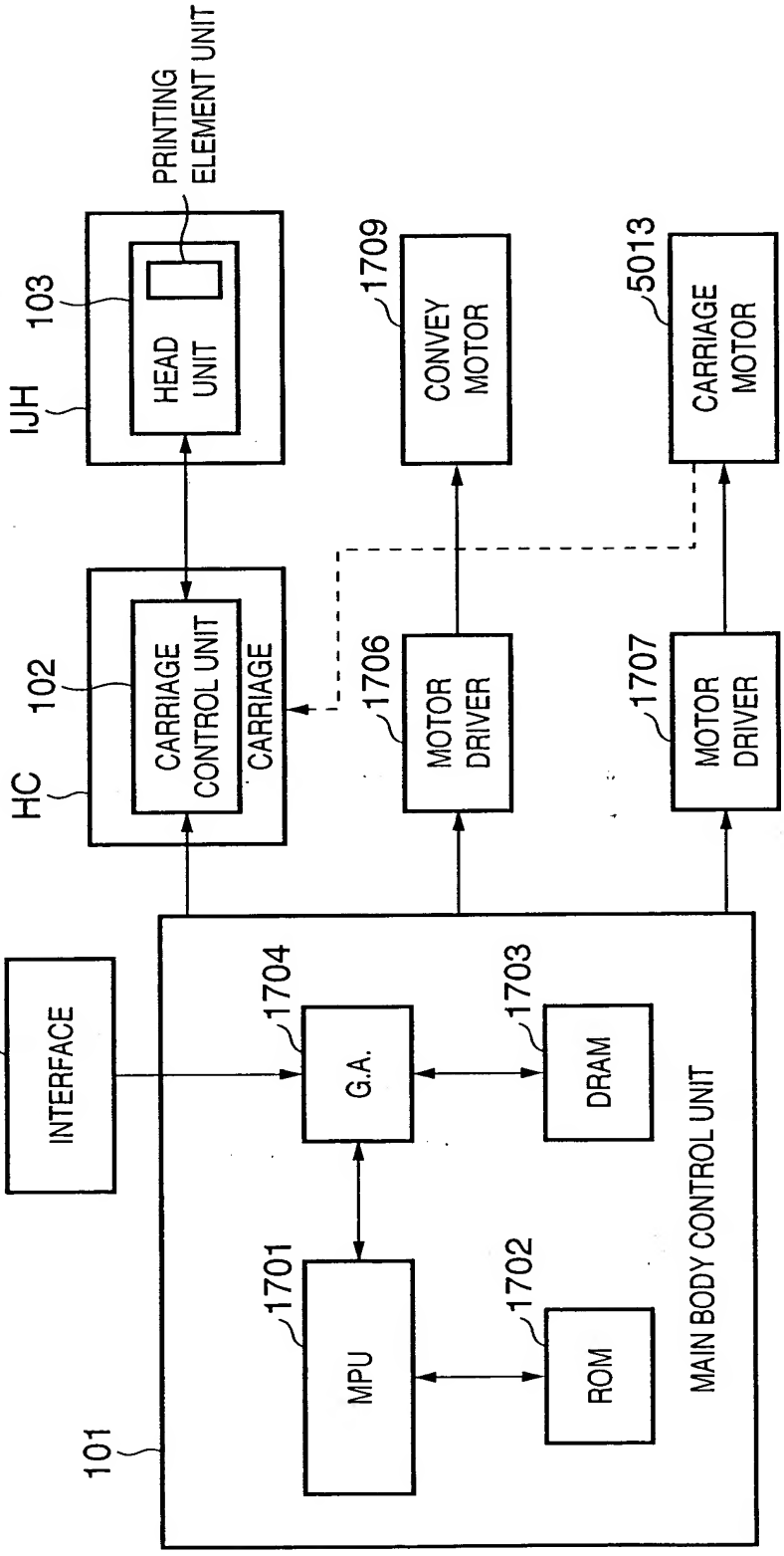

PRINTING ELEMENT UNIT
IJH
103
HEAD UNIT
1709
CONVEY MOTOR
5013
CARRIAGE MOTOR
HC
102
CARRIAGE CONTROL UNIT
CARRIAGE
1706
MOTOR DRIVER
1707
MOTOR DRIVER
1700
INTERFACE
1704
G.A.
1703
DRAM
1701
MPU
1702
ROM
MAIN BODY CONTROL UNIT
101

FIG. 3

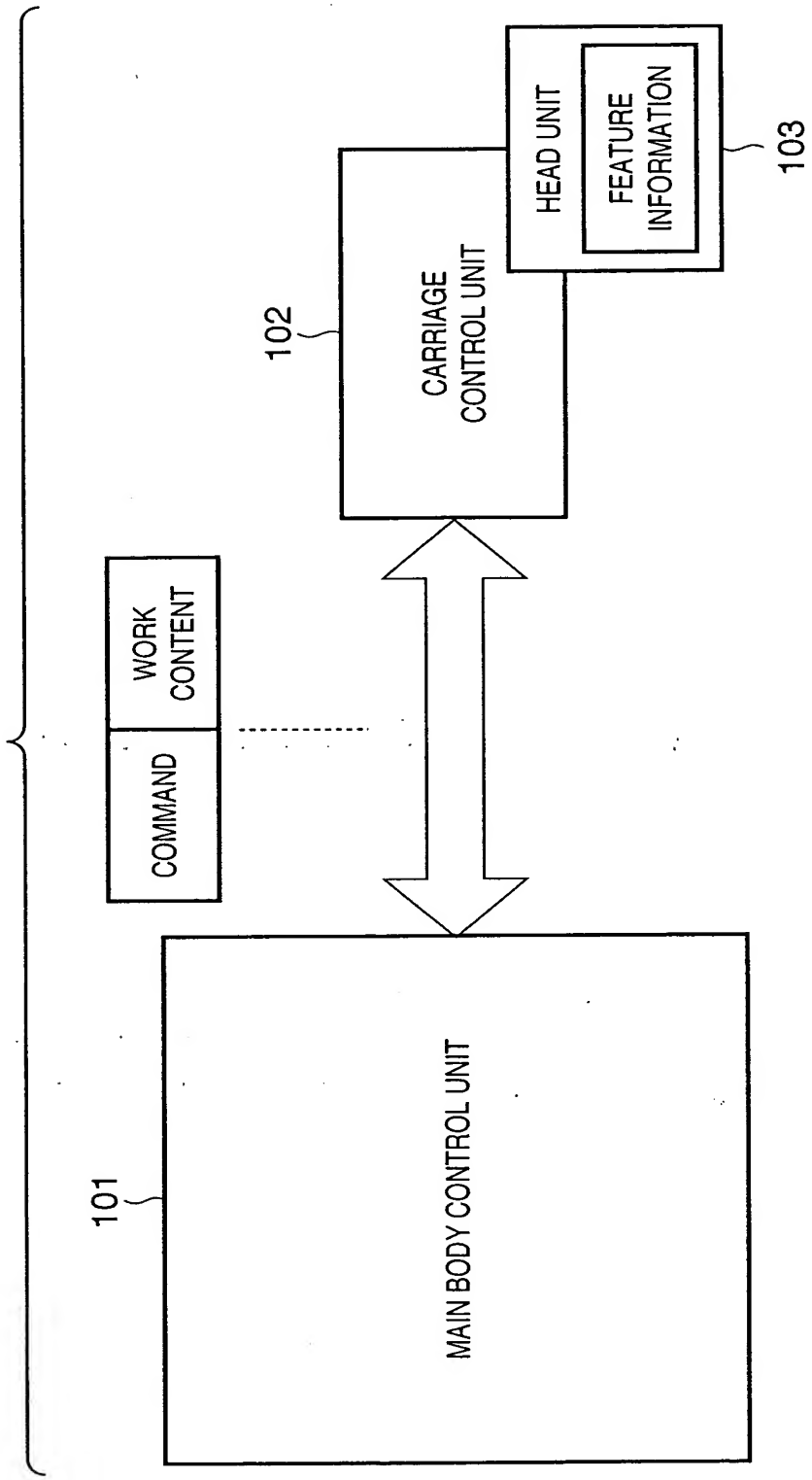

MAIN BODY CONTROL UNIT
101
COMMAND
WORK CONTENT
CARRIAGE CONTROL UNIT
102
HEAD UNIT
FEATURE INFORMATION
103

FIG. 4

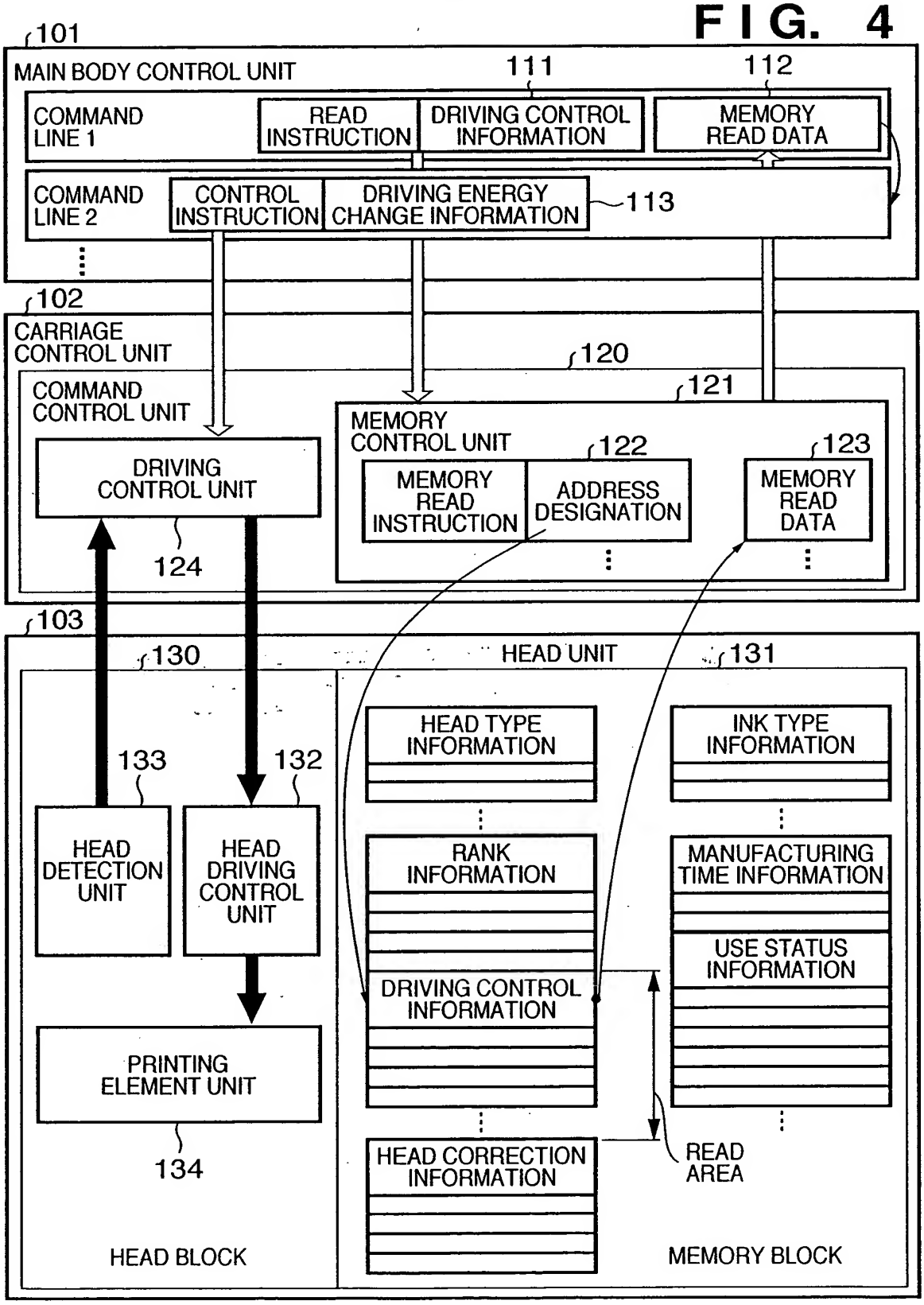

101
MAIN BODY CONTROL UNIT
111
112
COMMAND LINE 1
READ INSTRUCTION
DRIVING CONTROL INFORMATION
MEMORY READ DATA
COMMAND LINE 2
CONTROL INSTRUCTION
DRIVING ENERGY CHANGE INFORMATION
113
102
CARRIAGE CONTROL UNIT
120
121
COMMAND CONTROL UNIT
MEMORY CONTROL UNIT
122
123
DRIVING CONTROL UNIT
MEMORY READ INSTRUCTION
ADDRESS DESIGNATION
MEMORY READ DATA
124
103
130
HEAD UNIT
131
133
132
HEAD TYPE INFORMATION
INK TYPE INFORMATION
HEAD DETECTION UNIT
HEAD DRIVING CONTROL UNIT
RANK INFORMATION
MANUFACTURING TIME INFORMATION
USE STATUS INFORMATION
DRIVING CONTROL INFORMATION
PRINTING ELEMENT UNIT
134
HEAD CORRECTION INFORMATION
READ AREA
HEAD BLOCK
MEMORY BLOCK

FIG. 5

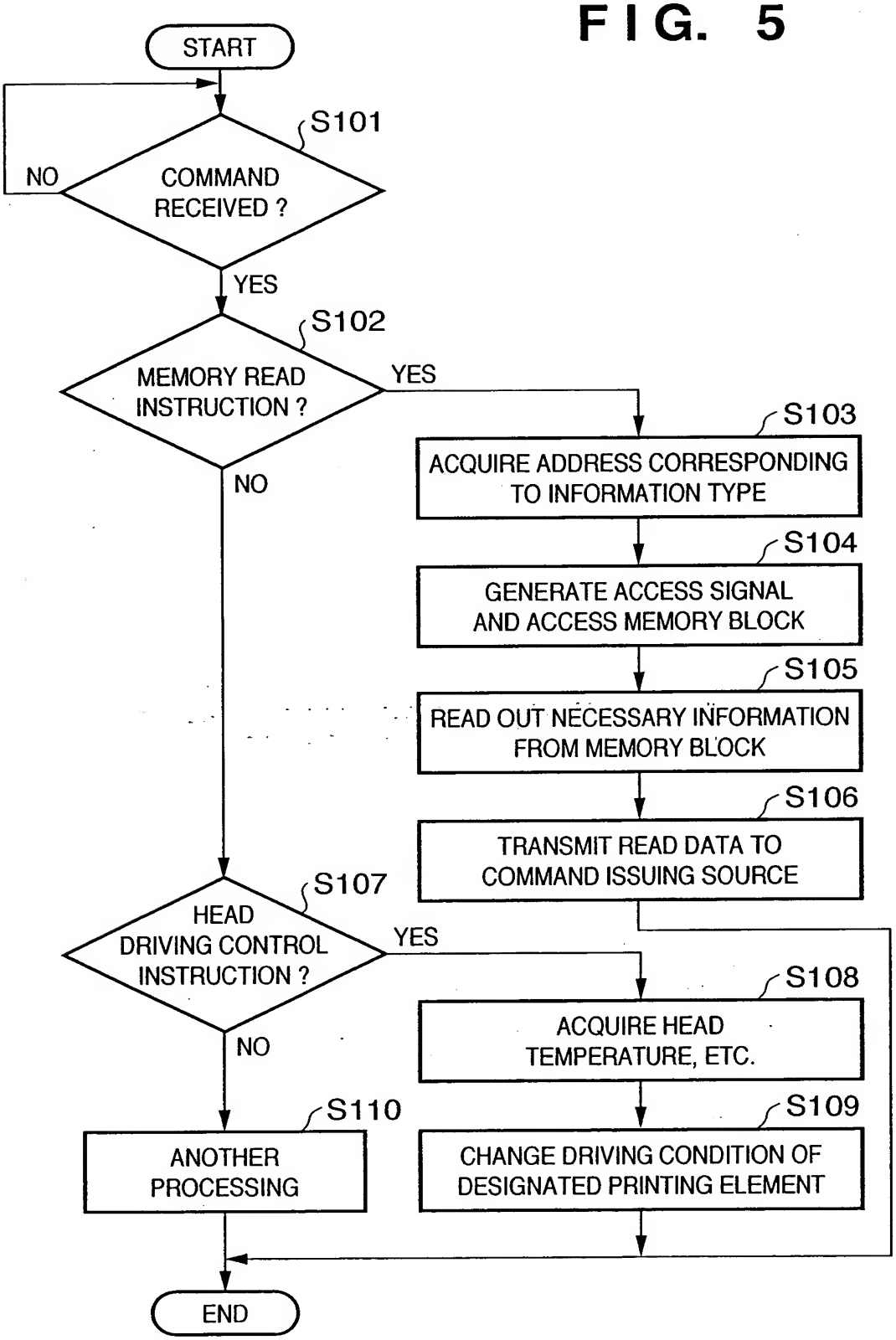

START
S101
COMMAND RECEIVED ?
NO
YES
S102
MEMORY READ INSTRUCTION ?
YES
NO
S103
ACQUIRE ADDRESS CORRESPONDING TO INFORMATION TYPE
S104
GENERATE ACCESS SIGNAL AND ACCESS MEMORY BLOCK
S105
READ OUT NECESSARY INFORMATION FROM MEMORY BLOCK
S106
TRANSMIT READ DATA TO COMMAND ISSUING SOURCE
S107
HEAD DRIVING CONTROL INSTRUCTION ?
YES
NO
S108
ACQUIRE HEAD TEMPERATURE, ETC.
S109
CHANGE DRIVING CONDITION OF DESIGNATED PRINTING ELEMENT
S110
ANOTHER PROCESSING
END

FIG. 6

INFORMATION IDENTIFICATION NAME	STORAGE ADDRESS
HEAD TYPE INFORMATION	0xXXXX ~ 0xYYYY
RANK INFORMATION	oxPPPPP ~ 0xQQQQ
DRIVING CONTROL INFORMATION	0xSSSS ~ 0xTTTT
HEAD CORRECTION INFORMATION	0xUUUU ~ 0xVVVV
INK TYPE INFORMATION	0xRRRR ~ 0xMMMM
MANUFACTURING TIME INFORMATION	0xNNNN ~ 0xLLLL
USE STATUS INFORMATION	0xJJJJ ~ 0xKKKK
⋮	⋮

FIG. 7

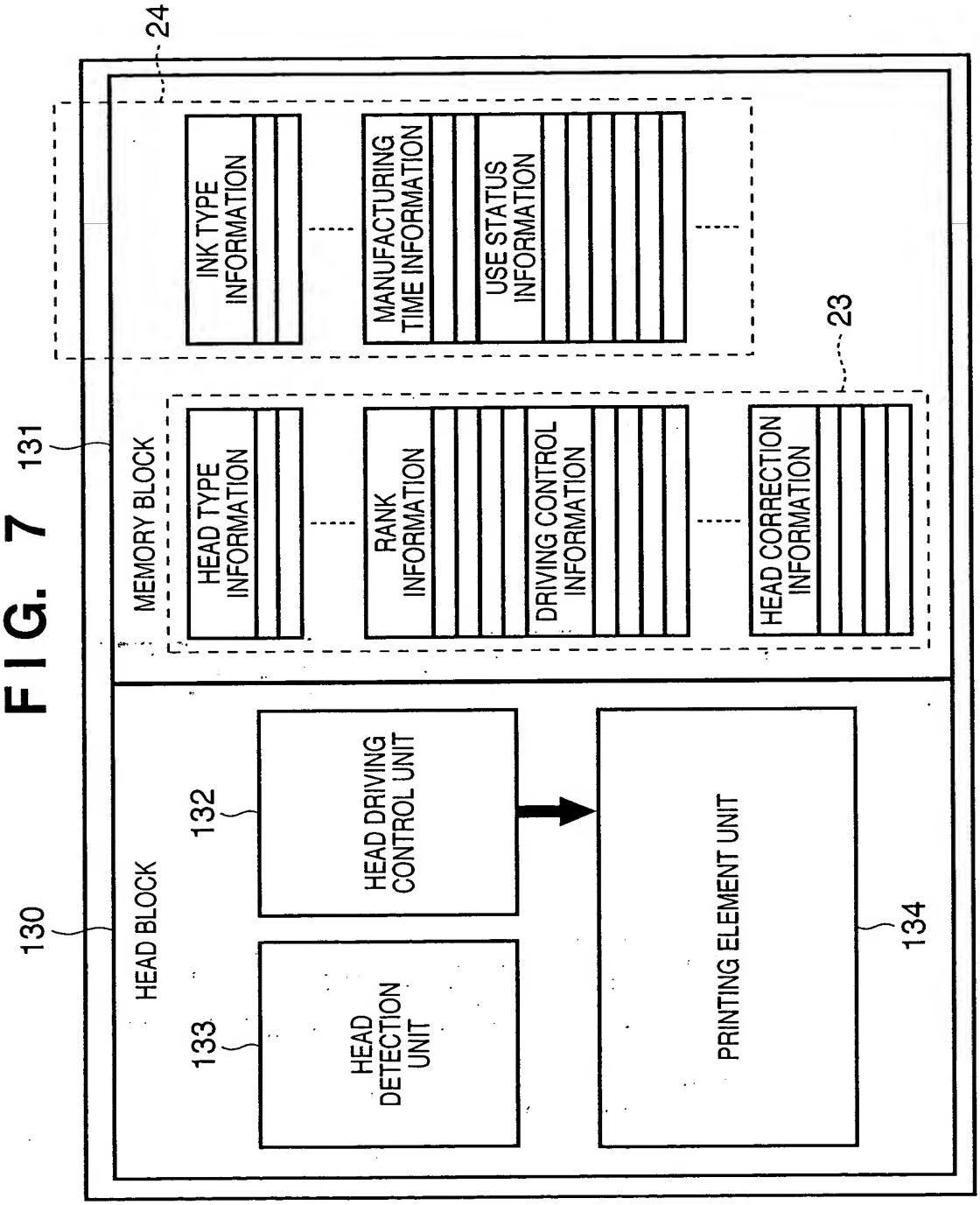

24
INK TYPE INFORMATION
MANUFACTURING TIME INFORMATION
USE STATUS INFORMATION
23
131
MEMORY BLOCK
HEAD TYPE INFORMATION
RANK INFORMATION
DRIVING CONTROL INFORMATION
HEAD CORRECTION INFORMATION
130
HEAD BLOCK
132
HEAD DRIVING CONTROL UNIT
133
HEAD DETECTION UNIT
PRINTING ELEMENT UNIT
134

FIG. 8

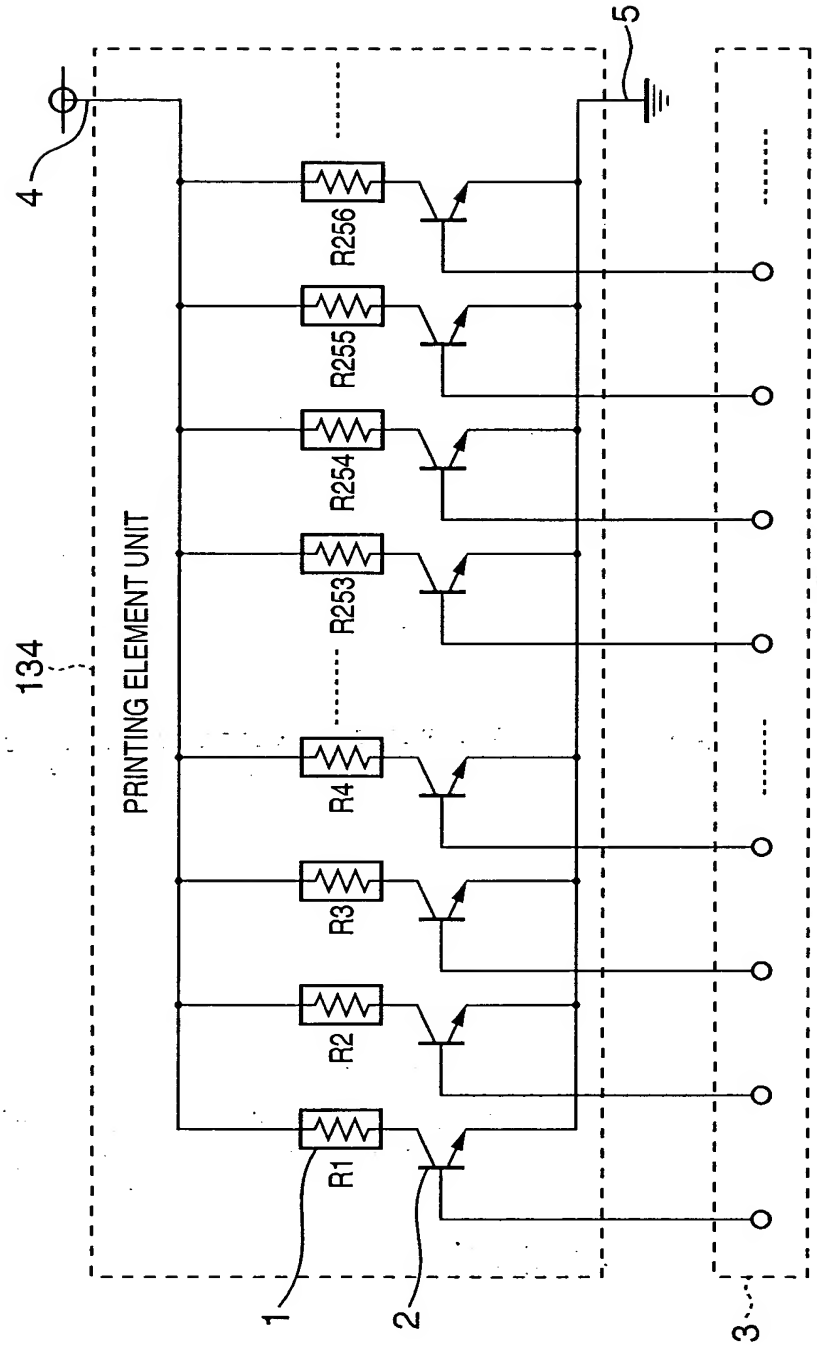

PRINTING ELEMENT UNIT
134
4
5
R256
R255
R254
R253
R4
R3
R2
R1
1
2
3

FIG. 9

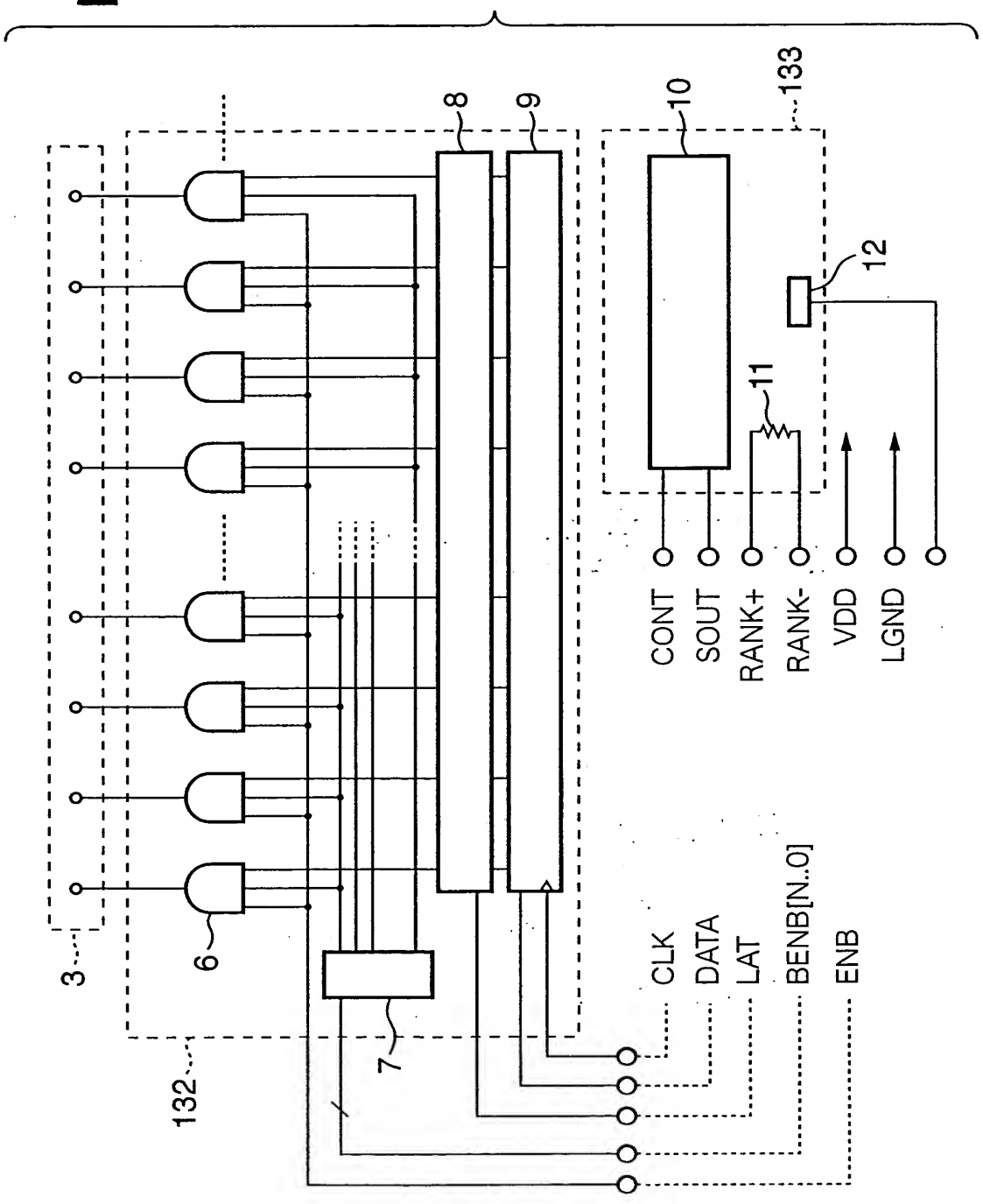

3
6
7
8
9
10
11
12
132
133
CONT
SOUT
RANK+
RANK-
VDD
LGND
CLK
DATA
LAT
BENB[N..0]
ENB

FIG. 10

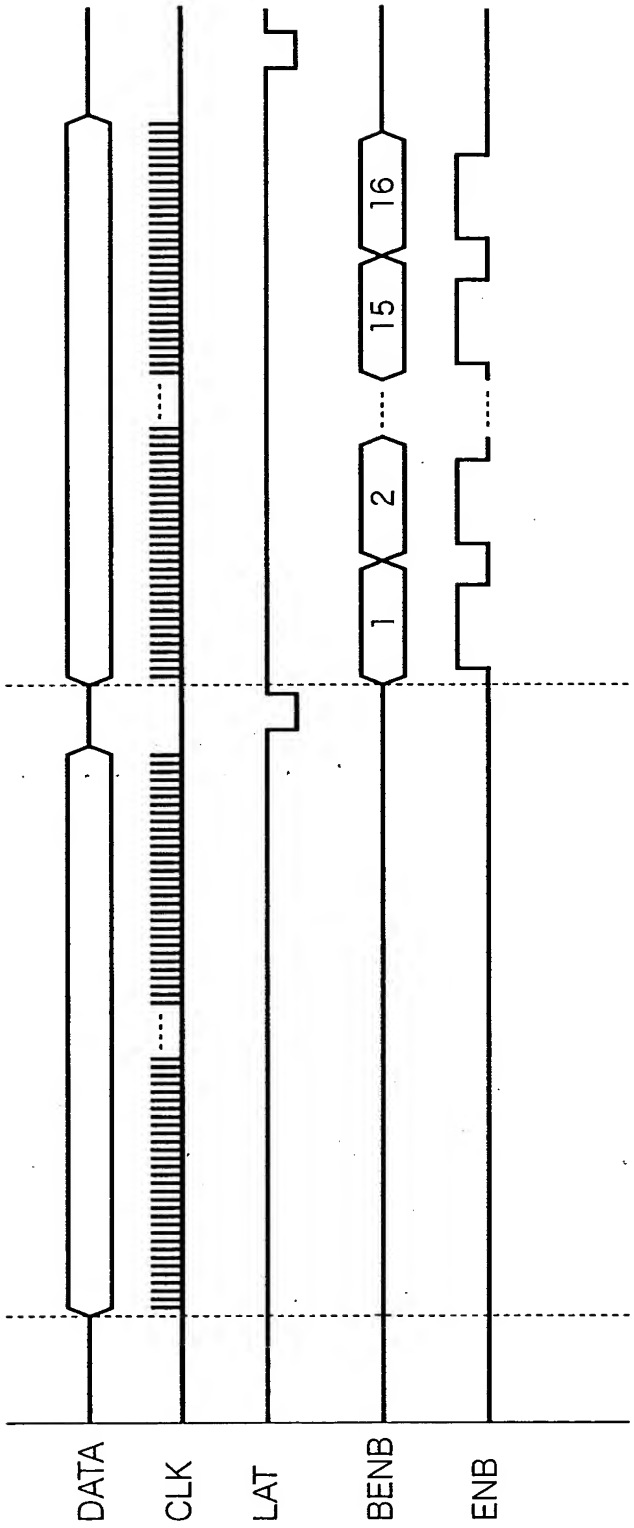


FIG. 11

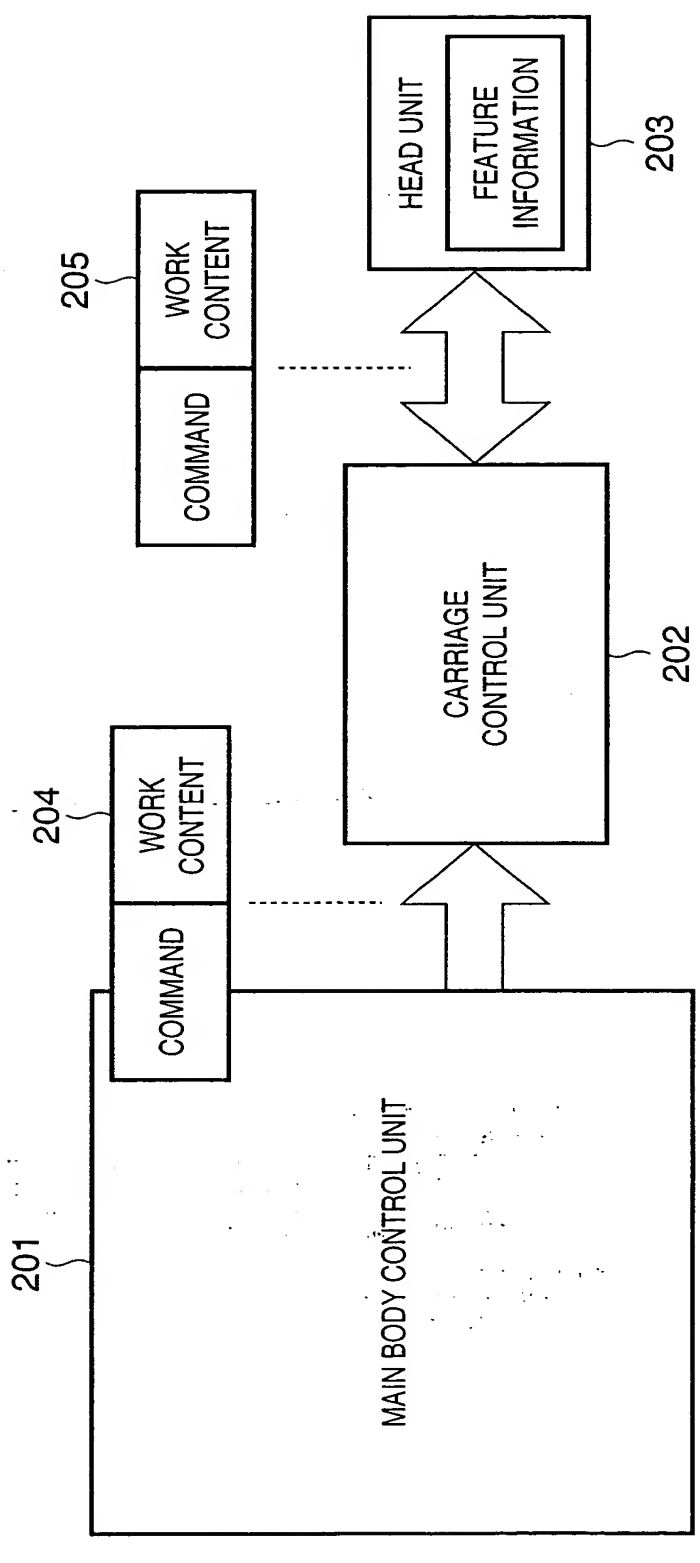

MAIN BODY CONTROL UNIT
201
COMMAND
WORK CONTENT
204
CARRIAGE CONTROL UNIT
202
HEAD UNIT
FEATURE INFORMATION
203
COMMAND
WORK CONTENT
205

FIG. 12

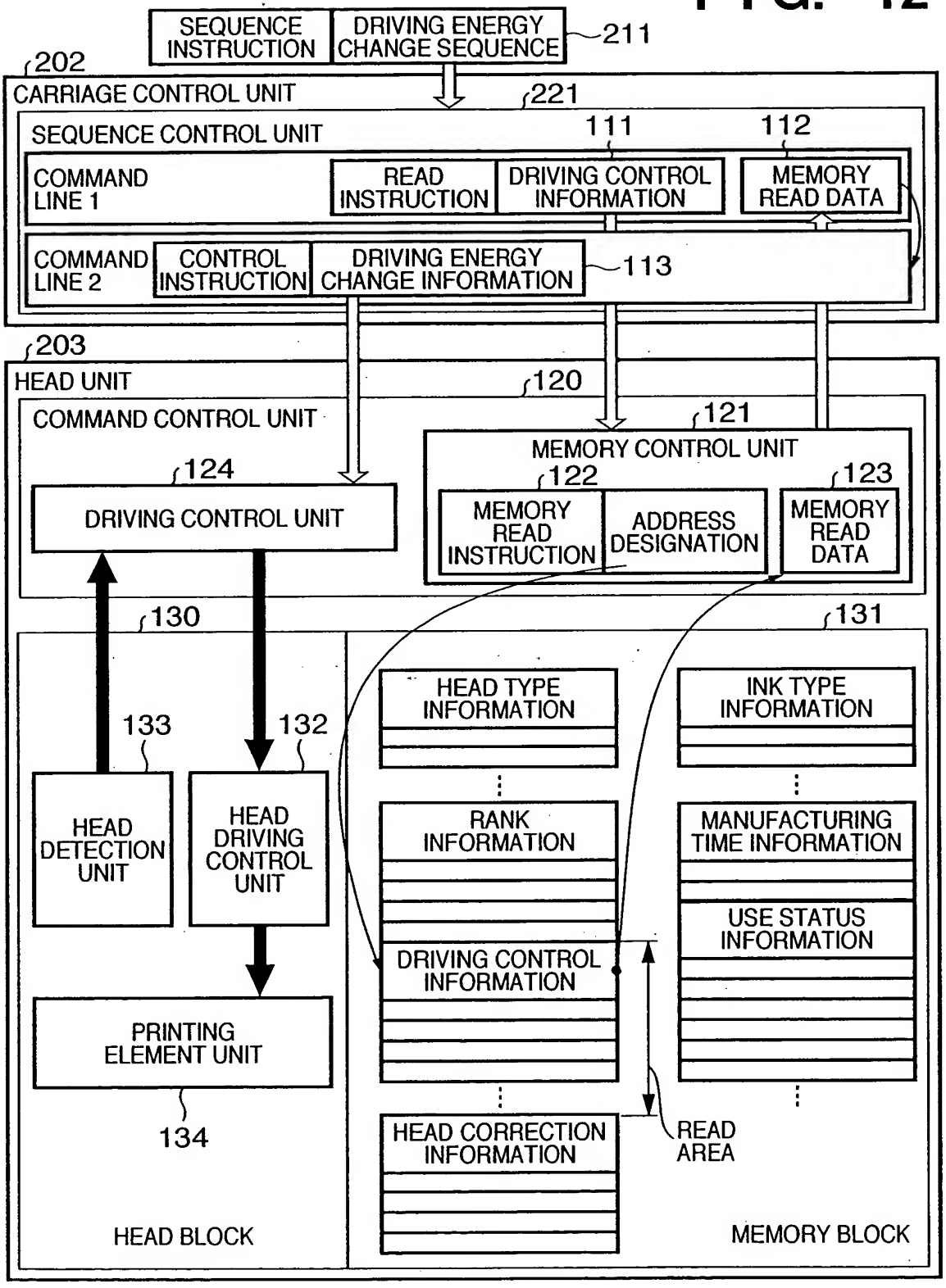

SEQUENCE INSTRUCTION
DRIVING ENERGY CHANGE SEQUENCE
211
202
CARRIAGE CONTROL UNIT
221
SEQUENCE CONTROL UNIT
111
112
COMMAND LINE 1
READ INSTRUCTION
DRIVING CONTROL INFORMATION
MEMORY READ DATA
COMMAND LINE 2
CONTROL INSTRUCTION
DRIVING ENERGY CHANGE INFORMATION
113
203
HEAD UNIT
120
COMMAND CONTROL UNIT
121
MEMORY CONTROL UNIT
124
DRIVING CONTROL UNIT
122
MEMORY READ INSTRUCTION
ADDRESS DESIGNATION
123
MEMORY READ DATA
130
131
133
132
HEAD DETECTION UNIT
HEAD DRIVING CONTROL UNIT
PRINTING ELEMENT UNIT
134
HEAD BLOCK
HEAD TYPE INFORMATION
RANK INFORMATION
DRIVING CONTROL INFORMATION
HEAD CORRECTION INFORMATION
INK TYPE INFORMATION
MANUFACTURING TIME INFORMATION
USE STATUS INFORMATION
READ AREA
MEMORY BLOCK

FIG. 13

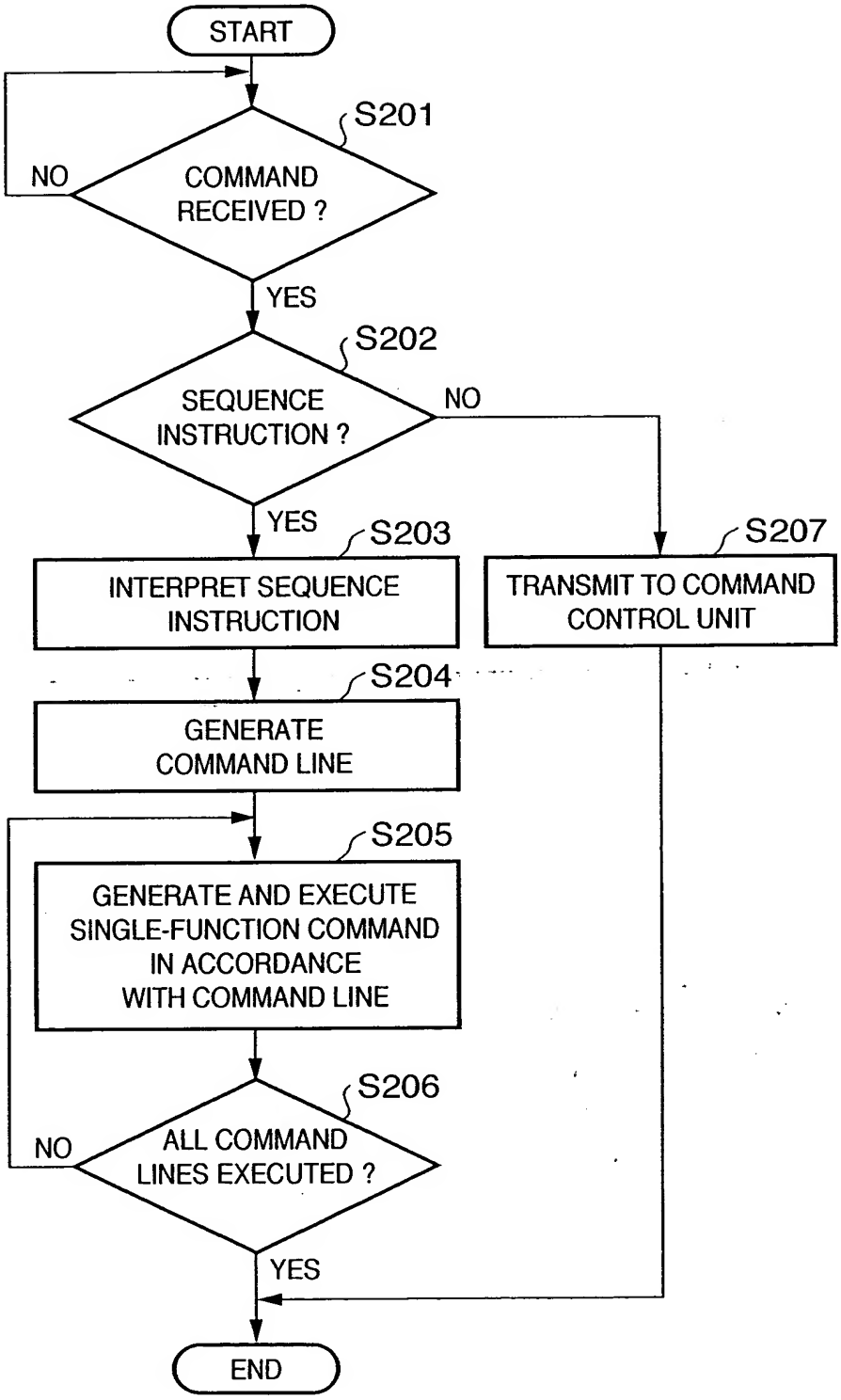

START
S201
COMMAND RECEIVED ?
NO
YES
S202
SEQUENCE INSTRUCTION ?
NO
YES
S203
INTERPRET SEQUENCE INSTRUCTION
S207
TRANSMIT TO COMMAND CONTROL UNIT
S204
GENERATE COMMAND LINE
S205
GENERATE AND EXECUTE SINGLE-FUNCTION COMMAND IN ACCORDANCE WITH COMMAND LINE
S206
ALL COMMAND LINES EXECUTED ?
NO
YES
END

FIG. 14

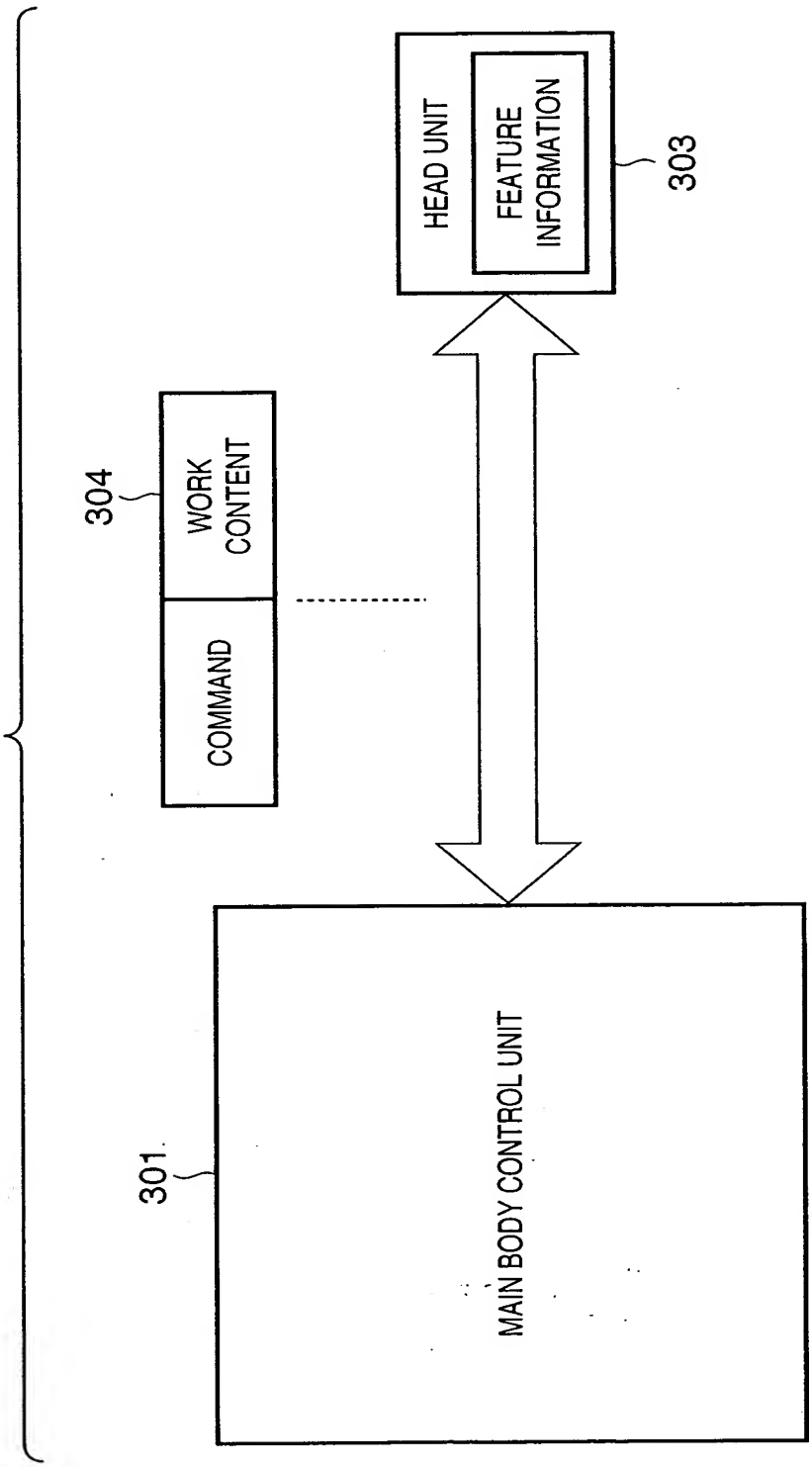

HEAD UNIT
FEATURE INFORMATION
303
304
WORK CONTENT
COMMAND
301
MAIN BODY CONTROL UNIT

FIG. 15

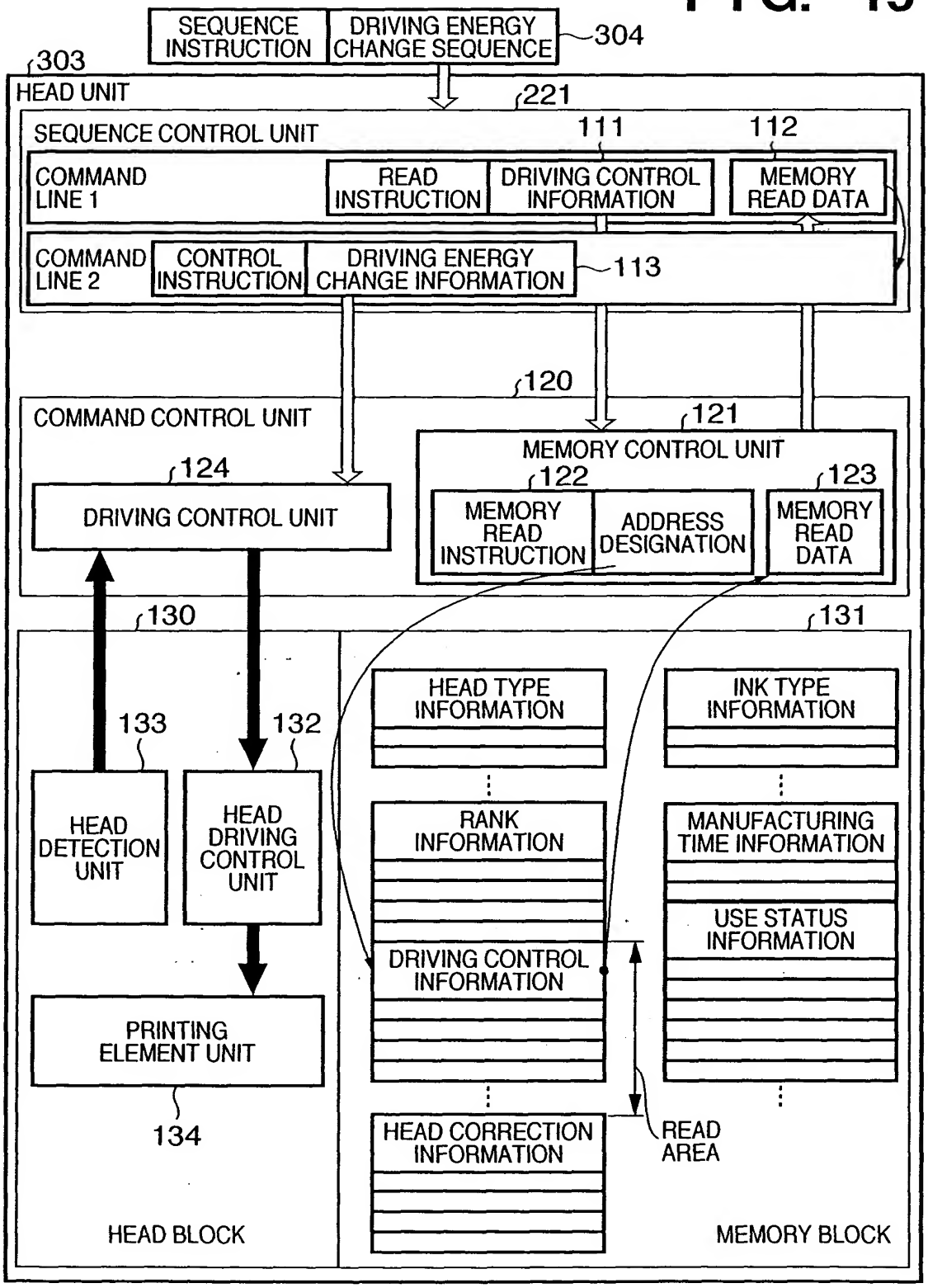

SEQUENCE INSTRUCTION
DRIVING ENERGY CHANGE SEQUENCE
304
303
HEAD UNIT
221
SEQUENCE CONTROL UNIT
111
112
COMMAND LINE 1
READ INSTRUCTION
DRIVING CONTROL INFORMATION
MEMORY READ DATA
COMMAND LINE 2
CONTROL INSTRUCTION
DRIVING ENERGY CHANGE INFORMATION
113
120
COMMAND CONTROL UNIT
121
MEMORY CONTROL UNIT
124
DRIVING CONTROL UNIT
122
123
MEMORY READ INSTRUCTION
ADDRESS DESIGNATION
MEMORY READ DATA
130
131
133
132
HEAD DETECTION UNIT
HEAD DRIVING CONTROL UNIT
PRINTING ELEMENT UNIT
134
HEAD TYPE INFORMATION
INK TYPE INFORMATION
RANK INFORMATION
MANUFACTURING TIME INFORMATION
USE STATUS INFORMATION
DRIVING CONTROL INFORMATION
HEAD CORRECTION INFORMATION
READ AREA
HEAD BLOCK
MEMORY BLOCK

FIG. 16

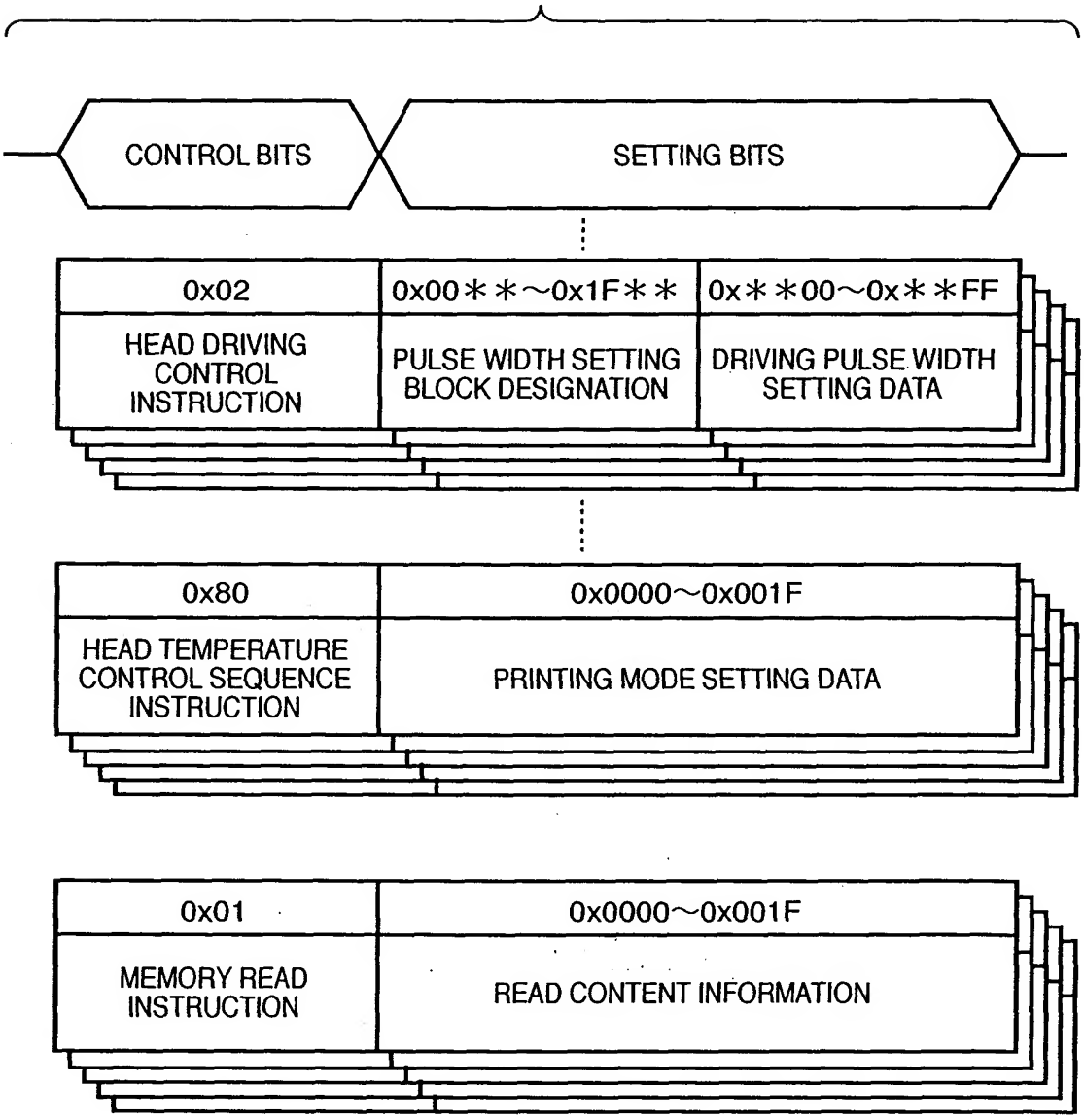
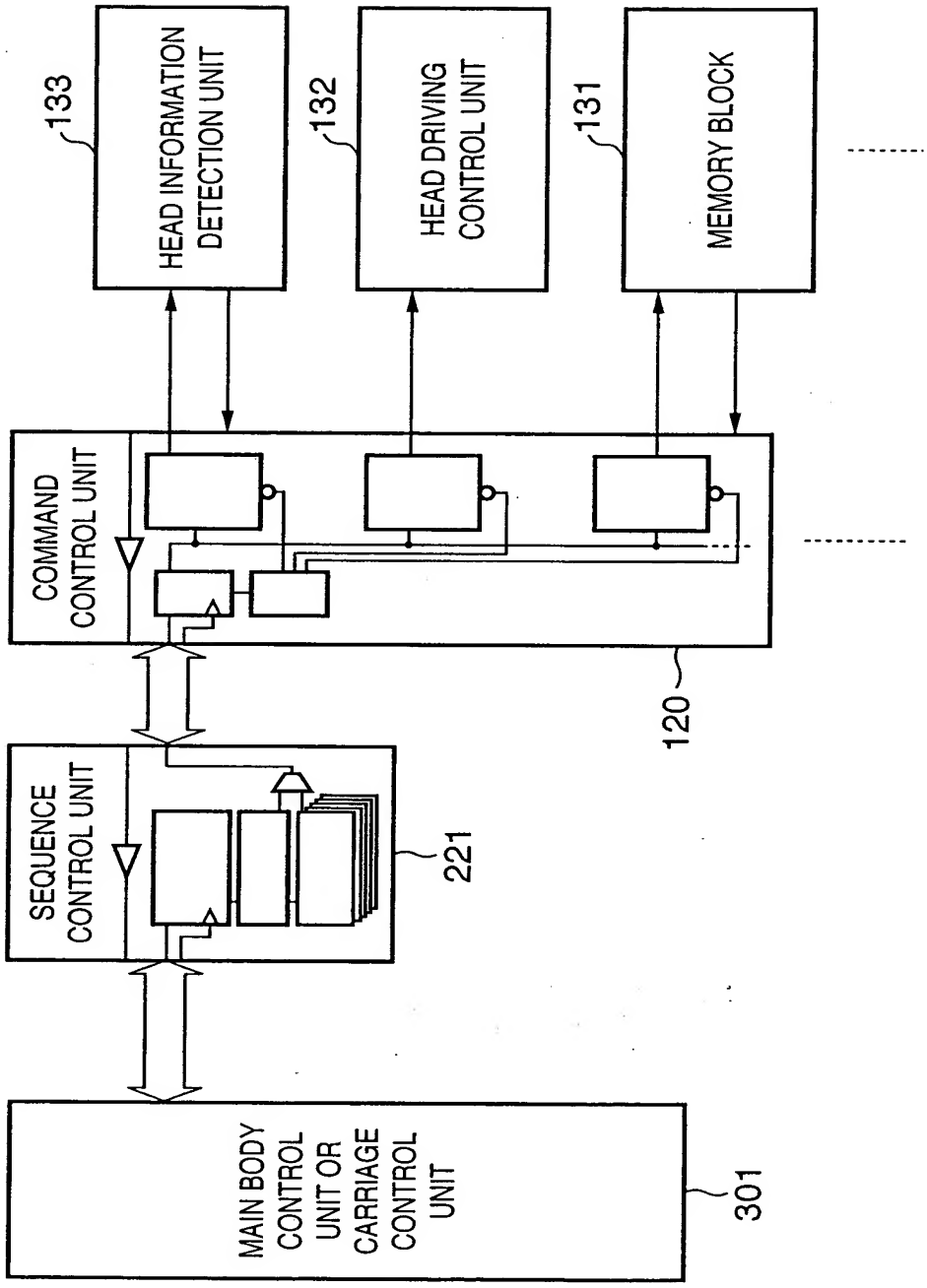

CONTROL BITS
SETTING BITS
0x02
0x00＊＊～0x1F＊＊
0x＊＊00～0x＊＊FF
HEAD DRIVING CONTROL INSTRUCTION
PULSE WIDTH SETTING BLOCK DESIGNATION
DRIVING PULSE WIDTH SETTING DATA
0x80
0x0000～0x001F
HEAD TEMPERATURE CONTROL SEQUENCE INSTRUCTION
PRINTING MODE SETTING DATA
0x01
0x0000～0x001F
MEMORY READ INSTRUCTION
READ CONTENT INFORMATION

FIG. 17


133
HEAD INFORMATION DETECTION UNIT
132
HEAD DRIVING CONTROL UNIT
131
MEMORY BLOCK
COMMAND CONTROL UNIT
120
SEQUENCE CONTROL UNIT
221
MAIN BODY CONTROL UNIT OR CARRIAGE CONTROL UNIT
301